

# CLAIMS

1. Apparatus for increasing the field of view of an image, the apparatus comprising:

an image source for producing said image;

5 relay optics having a first field of view, for optically transferring said image; and

a redirecting unit for selectively directing complementary fractions of said image to a reflecting unit at at least two angles, said redirecting unit switching between said angles at a speed such that the received image is invisibly and seamlessly integrated and the resultant field of view at said  
10 reflecting unit is wider than said first field of view.

2. The apparatus of claim 1, wherein said reflecting unit having diffractive optics formed therein.

3. The apparatus of claim 2 wherein said diffractive optics is one of binary optics, holograms and optic-powered implemented optics.  
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4. The apparatus of claim 2 wherein said reflecting unit having diffractive optics on its inner and outer faces so to create a total zero optical power for the outer scene.

5. The apparatus of claim 1, wherein the number of said fractions of an image is at least two.  
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6. The apparatus of claim 1, wherein said fractions of an image are of different wavelength.

7. The apparatus of claim 1, wherein said fractions of an image are of different polarization.

8. The apparatus of claim 1, wherein said redirecting unit comprises a controllable tilting mirror.

9. The apparatus of claim 1, wherein said redirecting unit comprises a controllable polarized reflecting device.

5 10. A helmet for providing an image to a user, the helmet comprising:

a reflecting unit with operative connection to said helmet;

an image source for producing said image;

relay optics having a first field of view, for optically transferring said image; and

10 a redirecting unit for selectively directing complementary fractions of said image to said reflecting unit at at least two angles, said redirecting unit switching between said angles at a speed such that the received image is invisibly and seamlessly integrated and the resultant field of view at said visor is wider than said first field of view.

15 11. The helmet of claim 10, wherein said reflecting unit having diffractive optics formed therein.

12. The helmet of claim 11 wherein said diffractive optics is one of binary optics, holograms and optic-powered implemented optics.

20 13. The helmet of claim 10 wherein said reflecting unit having diffractive optics on its inner and outer faces so to create a total zero optical power for the outer scene.

14. The helmet of claim 10, wherein the number of said fractions of an image is at least two.

15. The helmet of claim 10, wherein said fractions of an image are of different wavelength.

16. The helmet of claim 10, wherein said fractions of an image are of different polarization.

17. The helmet of claim 10, wherein said redirecting unit comprises a controllable tilting mirror.

5 18. The helmet of claim 10, wherein said redirecting unit comprises a controllable polarized reflecting device.

19. A method for producing a wide FOV in system having image source, relay optics and redirecting unit and reflecting unit, said method comprising the steps of:

10 splitting the image from said image source into plurality of complementary image fractions;

optically transferring said image fractions through said relay optics, said relay optic having a first FOV;

15 projecting said image fractions from said relay optics onto said redirecting unit, said redirecting unit selectively switching said image fractions in different angles onto said reflecting unit, such that the resultant image received from said reflecting unit is a seamless combination of said image fractions having a second FOV significantly greater than said first FOV.